

## InsightMe: Raising Awareness of Conveyed Personality in Social Media Traces

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### Abstract

Users' persistent social media contents like posts on Facebook Timeline are presented as an "exhibition" about a person to others, and managing these exhibitional contents for desired online image needs intentional and manual efforts. To raise awareness of and facilitate the management of conveyed the personality image around past contents, we developed a prototype called *InsightMe*. The system employs computational psycho-linguistic analysis to help users visualize the way their past text posts might convey impressions of their personality and allows users to modify their posts based on these analysis. We conducted a user study to evaluate the design. Overall, users found that such a tool raised awareness of the fact and the ways personality might be conveyed through their past content as one aspect of impression management, but that it needs design improvement to offer actionable suggestions for content modification, as well as careful thinking about impression management as one of many values people have about their digital past.

### Introduction

A key concern people have when they post contents to digital media, such as text posts, pictures, videos, and comments, is the management of conveyed image: creating images of themselves they want others to see. For example, the Facebook Timeline presents a record of your past interactions with the system, and this record, too, can create impressions of yourselves. Sometimes the original posters have little control over the system and people try to balance their concerns about the image presented with goals of personal recordkeeping (Zhao and Lindley 2014). Some users, especially active ones who have a lot of posts on timeline, might find that manually reviewing each post frequently, changing their access settings or deleting them takes tremendous time and efforts. Further, they might not be aware of the impressions they are creating, or of the audiences who might be seeing them.

There have been few design works on delivering the computation insights to actively support users to manage conveyed personality. Our research goal is to design and develop a prototype to probe the effects of such a tool, and help justify potential design choices. Particularly in this paper, we

take a step toward this goal through presenting and evaluating a system, *InsightMe*, designed to help people be aware of the personality images their past contents create, understand better how pieces of the contents contribute to their images, and easily modify the contents or access to them.

Online image is a complex term: a person's activity could present several impression-related traits about herself, such as personalities, values, emotions, interests, beliefs, and so on (Leary 1995). In this paper, we use big-five personality traits (see Table 1) as the research lens of image, because it has been recognized as one of the most focused and concerned facts in online self-disclosure on social network sites (Ellison and others 2007; Light et al. 2009), and several factors of users' personality have been found to either associate or predict some social media usage including the on-line image concerns (Amichai-Hamburger and Vinitzky 2010; Correa, Hinsley, and De Zuniga 2010; Hughes et al. 2012; Ryan and Xenos 2011).

Built upon a similar computational personality model (Gou, Zhou, and Yang 2014), we developed a prototype called, *InsightMe*, to explore what happens when a system presents people with information about their personality derived from that their writings on Facebook. The system offers three different levels of analysis and presentation of Big-five traits: the overall level, presenting what Big-five traits the whole timeline present; the individual post level, showing how each individual post contributes to the overall Big-five image; and the word level, showing how each word in a post associates with each trait in Big-five. The system also provides content management features to enable users edit their Timeline contents.

We conducted a user study on this system to analyze the effects of explicit presenting and explaining the derived online personality images, and evaluated the designs of such a facilitating tool. Our study shows that after using the system, participants raised their awareness of the presentational effects of Facebook Timeline contents. Some of the users raises their concerns and self-consciousness for future self-disclosure, though not all of them. Users also gave feedbacks about how different levels of analytic results given by the system have different values and limitations to facilitate their content management. They overall found a tool like this is useful for the awareness and reflection of their current personality presented on Facebook Timeline, but that it lacks

	Definitions
Openness	The extent to which a person is open to experience a variety of activities.
Conscientiousness	A tendency that a person acts in an organized or spontaneous way.
Agreeableness	A tendency to be compassionate and cooperative towards others.
Extraversion	A tendency to seek stimulation in the company of others.
Neuroticism	The extent to which a person's emotion is sensitive to the environment

Table 1: Definitions of Big Five Model of personality traits

the ability to offer actionable suggestions that people might take—and that, as also found by Zhao et al., people balance impression management concerns with a desire to retain personal posts.

### System and User Study Design

The system uses Facebook Graph API to get a user's own posts from her Timeline, because our research scope focuses on the projected online image by a person's own exhibitional content. Then, the posts are passed to a Big5 modeling module to generate a personality profile including the five OCEAN factors (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism). In this model, posts are first decomposed as a bag of words with standard text processing techniques. A personality trait is computed by a linear combination of relevant LIWC category scores and each LIWC category score is the normalized frequency of the words that belong to the LIWC category and are also used in the posts. LIWC category scores are multiplied by weights/coefficients where coefficients come from the Big 5 personality model adopted from (Gou, Zhou, and Yang 2014; Yarkoni 2010). The scores are normalized as percentile values over a large personality pool we built with 3 millions social media users.

These traits are computed at the overall level (including all posts from a user) for different audience groups and the individual post level, along with the evidence of the association of word use towards personality traits. Then, the system offers visual representations of the overall image for audiences, and the contribution of each individual post towards different traits of the overall image. Users can then see which words and posts most strongly contribute to their profile. Finally, users can manage their contents by editing the content, changing the visibility to different audiences, or deleting posts, as shown in Figure 1.

To help tease apart the priming of personality from the effect of the interface, we developed a control interface (Non-Insight) similar to that shown earlier in Figure 1. It did not present any analysis, but did present explanations about the Big5 personality that the online contents may reveal and access to the content management features. Each participant used both Non-Insight interface and the *InsightMe* interface. For each interface, the system retrieved half of the partici-

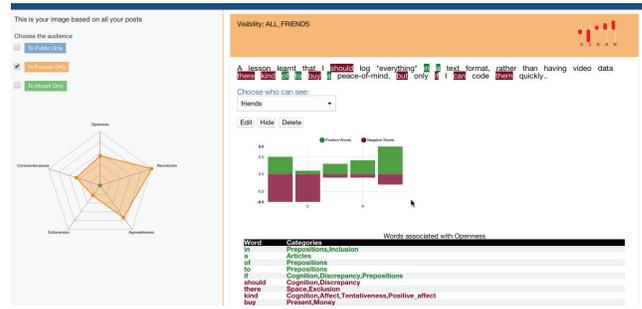


Figure 1: The *InsightMe* interface. The radar chart shows the overall personality to different audiences based on the corresponding posts set. On the right, it shows each post's analytic results. The upper right chat on shows how this post contributes to each trait towards the overall personality profile. A user can also change the audience of each post, and edit, hide or delete a post. The middle bar chart shows numbers of positively and negatively associated words in the post to each trait. When the user click each bar, a table is shown below the chart, presenting all words associated with traits. Green highlighted words are positively associated, while the red highlighted are negatively associated.

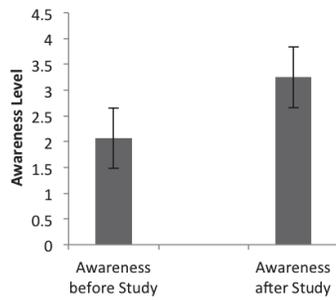
part's Facebook Timeline posts based on the posts' created time, and either generated the personality analytic results in the *InsightMe* interface, or simply shows the posts in the Non-Insight interface. The study sessions were counterbalanced by the order of using two interfaces, and the order of which half of the posts being used, and therefore we have 4 (2 interfaces order X 2 Facebook Timeline posts selection). We asked questions about users' awareness of contents' personality presentation effects, and their concerns about personality presentation, in both the pre and post-study surveys. In the post-study survey we also asked about their anticipated future practices on content reviewing and managing on Facebook Timeline to track changes in their actions. At the end of the study we conducted a short semi-structured interview asking participants how they perceived the personality results, whether and how each kind of insight result influenced their views and management of their Timeline posts, and any concerns and issues they had with the interfaces.

We recruited our participants from the Facebook Group of a large U.S. technology enterprise in California. A total of 16 users who had enough Timeline content to compute meaningful personality profiles participated the study (we set the minimal number of words as 2000 words based on the model stability results from prior work (Gou, Zhou, and Yang 2014)) and they were paid by lunch vouchers after finishing the study.

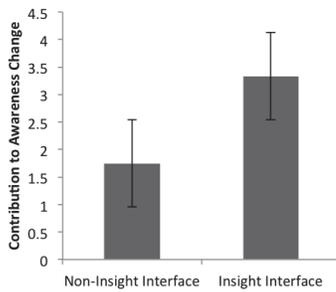
## Results

### “Now I Am Aware”

As shown in Figure 2(a), after participating the study, participants were more aware of personality presentational effects of their Facebook Timeline contents, which was not just because of invoking the concept of personality. The Non-



(a)



(b)

Figure 2: (a) The raised awareness of personality presentational effects of online exhibitional contents. Awareness level is from 1 to 5, where 1 means “not at all aware” and 5 means “extremely aware”.  $F(1, 15)=27, p<0.005$ . (b) How the Non-Insight interface and *InsightMe* interface influenced awareness changes. Influence level is from 1 to 5, where 1 is “not at all influential” and 5 means “extremely influential”.  $F(1, 15)=19.56, p<0.001$ .

Insight interface had low ratings regarding the change of awareness, while the *InsightMe* interface had much higher ratings, as shown in Figure 2 (b).

Interview data also showed that different levels of granularity (overall, posts, and words) provided different ways of reflecting on their presented personality. Overall image did lead some participants to think about what personality traits they wanted to convey:

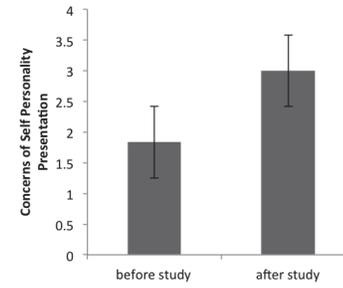
*“I did not know that on Facebook I am like not that agreeable to others, and now I know it, and I will post less posts that are not agreeable and try to be more corporative to others, in the future.(P04)”*

For the post level results, participants found the results also helped them to get aware of how each post could contribute to the overall personality image:

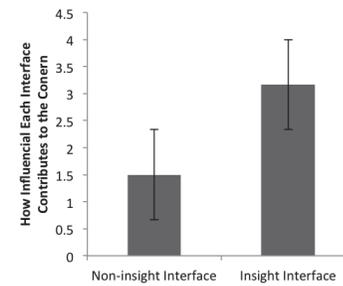
*“[The post level results] are useful, and make me aware of the personality can be learned from the posts (P02)”*

Word level insights were used to understand why a given post was contributing to the overall computed personality, although most participants found it difficult to understand the word-level insights at beginning:

*“The word level is a little bit confusing, because I think most of the words, the extracted positive and negative words*



(a)



(b)

Figure 3: a) The raised concerns of personality presentational effects of online exhibitional contents. Concern level is from 1 to 5, where 1 means “not at all concerned” and 5 means “extremely concerned”.  $F=9.14, p<0.01$ . (b) How the Non-Insight interface and *InsightMe* interface influenced participant’s change of concerns of presentational effects of their Facebook Timeline contents. Influence level is from 1 to 5, where 1 is “not at all influential” and 5 means “extremely influential”.  $F(1, 15)=19.64, p<0.01$ .

*are, like prepositions, articles that are like less with particular meanings (P04)”*.

### Conflicts Influence Concerns

As with awareness, concerns about the presentation of one’s personality also emerge from the data. In the survey, as shown in Figure 3(a), the concern raises after participants finished the experiment, and as shown in Figure 3(b), the effect is not just about the awareness of personality, but driven more directly by the information presented in the *InsightMe* interface.

Interestingly, these concerns may have been less about whether the computed personality presented a desired image and more about whether the system “got it right” in the sense of being an accurate model. In a survey question that asked about how well the computed personality agreed with their own perceptions of their personality, the average rating was a neutral 3 on a 5 point scale. In the interviews, participants also focused on how the computed personality agreed with those perceptions, rather than with a desired image:

*“I think somewhat it is true. Like I am very open to new ideas. And some posts [analysis] have very high accuracy, like the conscientiousness, the posts ranked at the bottom of*

*the conscientiousness are the posts that I complained that I don't have time for my exams. I think that has very high accuracy. (P06)*"

### **Awareness, Concern, but no Curation**

This absence of a desired image may have affected people's desire to curate their past content. Log data shows that participants did not make many changes to these posts as we hypothesized. Only few participants changed the posts (average edit action per user = 1.1, SE=1.45).

Still, despite the low frequency of intentional actions and the forces leading toward a lack of content management in the study, some participants reported that seeing the computational personality analysis might influence future disclosure behavior for new content:

*"First, I will be more careful posting things on Facebook. I do not want to post the too negative posts. The other thing is that now I know it could be posted to public and friends, and I want to make it more clear whether to public or to friends (P15)"*.

Participants also reported that they would not hide or delete posts because the content itself and its meaning to them were more important in an exhibitional context than the personality it might convey.

*"I think when I posted some contents, I was not aware that on Facebook I post mostly to public or to friends, maybe because I do not use very frequently. But for posts to my friends, I'd like to post something happened in my life, to my friends. But for some interesting posts I see on other website, like some videos on Youtube, I'd like to share to public. And for myself, the posts could be like, I see something, and I want to record, but I don't have a system to record it, so I post on Facebook to myself (P04)"*.

This description aligns closely with ideas from Zhao et al. (2013) about the use of social media as a personal archive—even if that past self is different from the present.

*"I don't want to revise my timeline very largely, because yeah, I'd like to see how my past, like my old me behave in a few years ago. Because at least I can see that at that period time, what my personality is, and maybe it is interesting to see how the personality is changing over time. (P05)"*

Some participants also worried that sudden changes to old exhibitional contents might lead others to think the personality presented on Facebook is less real or consistent to the user's real personality offline, and thus has a risk being perceived as deceptive.

*"I don't think I will use something like that, because it will make it fake to you, and if that is the way, I will just post to myself. I don't want to share such a thing with others (P14)"*.

### **Conclusion**

In this study, we designed and developed a prototype, *In-sightMe*, to present our idea of using computational method to raise the awareness of, offer useful information towards, and facilitate users' management of conveyed personality around contents they have posted to social media in the past. The user study showed that although the system did increase

awareness, more work will be needed to help users understand how personality images are conveyed and what actionable strategies need to be taken for improving their images. More generally, it showed that managing conveyed personality is one of many concerns people have when they are working with their past contents: that fidelity, consistency, respect for the past, and personal archiving are all values that coexist with online image management. Future systems in this space will need to account for these issues.

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